**"The Trans-Carpathian Seminar on Geometry & Physics"**

(See also the Geometry & Physics @ DFT seminar homepage)

*Date*: Wednesday, Mar. 26, 2025, 15:15 EET (Bucharest time)

*Location*: online via Zoom

*Speaker*: **Witold Respondek** (Institute of Automatic Control, Łódz University of Technology, Poland & INSA Rouen Normandie, France)

*Title*: **Linearization of mechanical control systems**

*Abstract*: For mechanical control systems, we present the problem of linearization that preserves the mechanical structure of the system. We give necessary and sufficient conditions for the mechanical state-space linearization and mechanical-feedback linearization using geometric tools, like covariant derivatives, symmetric brackets, and the Riemann tensor, that have an immediate mechanical interpretation. In contrast with linearization of general nonlinear systems, conditions for their mechanical counterpart can be given for both, controllable and noncontrollable, cases. We illustrate our results by examples of linearizable mechanical systems. The talk is based on joint research with Marcin Nowicki (Politechnika Poznań University of Technology, Poland). Due to the equipment failure the seminar will be in on-line mode only.